

WHAT IS CLAIMED IS:

1. A polypeptide immunogen comprising an amino acid sequence at least 90% identical to SEQ ID NO: 1, wherein said polypeptide provides protective immunity against *S. aureus* and wherein if one or more additional polypeptide regions are present said additional regions do not provide a carboxyl terminus containing amino acids 609-645 of SEQ ID NO: 2.
2. The polypeptide of claim 1, wherein said polypeptide consists of an amino acid sequence at least 90% identical to SEQ ID NO: 3 or a fragment thereof comprising an amino acid sequence at least 90% identical to SEQ ID NO: 1.
3. The polypeptide of claim 2, wherein said polypeptide consists of an amino acid sequence at least 94% identical to SEQ ID NO: 3, or a fragment thereof comprising an amino acid sequence at least 94% identical to SEQ ID NO: 1.
4. The polypeptide of claim 3, wherein said polypeptide consists of an amino acid sequence at least 94% identical to SEQ ID NO: 1, SEQ ID NO: 3 or SEQ ID NO: 42.
5. The polypeptide of claim 1 wherein said polypeptide consists essentially of the amino acid sequence of SEQ ID NOs 1, 3, 7, 17, 20, or 42.
6. The polypeptide of claim 5 wherein said polypeptide consists of the amino acid sequence of SEQ ID NOs 1, 3, 7, 17, 20, or 42.
7. An immunogen comprising an amino acid sequence at least 90% identical to SEQ ID NO: 1, wherein said immunogen consists of said amino acid sequence and one or more additional regions moieties covalently joined to said sequence at the carboxyl terminus or amino terminus, wherein each region or moiety is independently selected from a region or moiety having at least one of the following properties: enhances the immune response, facilitates purification, or facilitates polypeptide stability.
8. A composition able to induce a protective immune response in a patient comprising an immunologically effective amount of the immunogen of any one of claims 1-7 and a pharmaceutically acceptable carrier.

9. The composition of claim 8, wherein said composition further comprises an adjuvant.

10. A nucleic acid comprising a recombinant gene comprising a nucleotide
5 sequence encoding the polypeptide immunogen of any one of claims 1-6.

11. The nucleic acid of claim 10, wherein the recombinant gene lacks at least substantially all of a signal peptide encoding sequence and a cell wall sorting signal sequence.

10 12. The nucleic acid of claim 10, wherein said recombinant gene contains one or more codons optimized for yeast expression.

13. The nucleic acid of claim 12, wherein said nucleotide sequence is at least 50% codon optimized for expression in yeast.

15 14. The nucleic acid of claim 10, wherein said nucleic acid is an expression vector.

15 15. The nucleic acid of claim 10, wherein said nucleotide sequence is selected
20 from the group consisting of: SEQ ID NO: 30, SEQ ID NO: 31, SEQ ID NO: 32, SEQ ID NO: 33, SEQ ID NO: 34, SEQ ID NO: 35, SEQ ID NO: 36, SEQ ID NO: 37, SEQ ID NO: 38, SEQ ID NO: 39, SEQ ID NO: 40, SEQ ID NO: 41, SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51, SEQ ID NO: 52 and SEQ ID NO: 53.

25 16. The nucleic acid of claim 15, wherein said nucleic acid is an expression vector.

17. A recombinant cell comprising the nucleic acid of any one of claims 10-
16.

30 18. A method of making a *S. aureus* polypeptide that provides protective immunity comprising the steps of:

(a) growing the recombinant cell of claim 17 under conditions wherein a polypeptide is expressed; and

35 (b) purifying said polypeptide.

19. The method of claim 19, wherein said recombinant cell is a *S. cerevisiae*.

20. A method of inducing a protective immune response in a patient
5 comprising the step of administering to said patient an immunologically effective amount of an immunogen comprising a polypeptide, wherein said polypeptide comprises an amino acid sequence at least 90% identical to SEQ ID NO: 1 and provides protective immunity against *S. aureus*.

10 21. The method of claim 19, wherein said immunogen is the immunogen of any one of claims 1-7.

22. The method of claim 21, wherein said patient is a human.

15 23. The method of claim 22, wherein said patient is treated prophylactically against *S. aureus* infection.

24. A method of inducing a protective immune response in a patient
comprising the step of administering to said patient an immunologically effective amount of a
20 polypeptide made by the method of claim 18.

25. A method of inducing an anamnestic response in a patient comprising the
step of administering to said patient an effective amount of an immunogen comprising a
polypeptide, wherein said polypeptide comprises an amino acid sequence at least 90% identical
25 to SEQ ID NO: 1 and provides protective immunity against *S. aureus*.

26. The method of claim 25, wherein said anamnestic response results in at least a 3-fold increase in geometric titer over pre-existing titer within 3 days.

30 27. A yeast optimized nucleic acid sequence encoding an ORF0657n related polypeptide that provides protective immunity against *S. aureus* infection, or a fragment thereof comprising an amino acid sequence at least 90% identical to SEQ ID NO: 1.

28. The yeast optimized nucleic acid of claim 27, wherein said nucleic acid
35 sequence does not encode an ORF0657n signal peptide or cell wall sorting signal sequence.

29. A method of making a polypeptide that provides protective immunity against *S. aureus* comprising the steps of

(a) growing a recombinant yeast cell under conditions wherein said polypeptide is expressed, wherein said recombinant yeast cell comprises a recombinant gene encoding said polypeptide and said polypeptide is a full-length ORF0657n related polypeptide that provides protective immunity against *S. aureus* infection, or a fragment thereof comprising an amino acid sequence at least 90% identical to SEQ ID NO: 1; and

(b) purifying said polypeptide.

30. The method of claim 29, wherein said recombinant gene does not encode a functional ORF0657n cell wall sorting signal sequence.

31. The method of claim 29, wherein said recombinant gene does not encode a functional ORF0657n cell wall sorting signal sequence or a signal peptide sequence.

32. The method of claim 29, wherein said recombinant yeast cell is *S. cerevisiae* and said nucleotide sequence encodes a polypeptide of SEQ ID NO: 1, 3, 7, 17, or 20.